

Serial No. 09/833,538
October 21, 2003
Reply to the Office Action dated May 22, 2003
Page 2 of 8

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (canceled).

Claim 2 (original): ~~A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 1,~~ A longitudinally coupled resonator-type surface acoustic wave filter comprising:

a piezoelectric substrate; and

at least three IDTs arranged on said piezoelectric substrate along the propagation direction of the surface acoustic wave, each having a plurality of electrode fingers; wherein

in at least one of the at least three IDTs, the electrode finger period of a first portion that is adjacent to the side edge of another of the IDTs in the propagation direction of the surface acoustic wave is different from the electrode finger period of a second portion that is the remaining portion of said at least one of the IDTs, the wavelengths of the surface acoustic waves determined by the electrode finger periods of said first portion and said second portion being λ_1 and λ_2 , respectively; and

~~wherein~~ the electrode finger period of said first portion is shorter than the electrode finger period of said second portion.

Claim 3 (original): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 2, wherein the electrode finger period of said first portion is about 0.82 to about 0.99 times the electrode finger period of said second portion.

Serial No. 09/833,538

October 21, 2003

Reply to the Office Action dated May 22, 2003

Page 3 of 8

Claim 4 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 4~~2~~, wherein both of a pair of the IDTs which are adjacent to each other are arranged so that the electrode finger period of said first portion is different from the electrode finger period of said second portion, and a center distance between adjacent electrode fingers of said pair of adjacent IDTs is substantially equal to $0.5\lambda_{I1}$.

Claim 5 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 4~~2~~, wherein only one of a pair of the IDTs which are adjacent to each other is arranged so that the electrode finger period of said first portion is different from the electrode finger period of said second portion, and the center distance between adjacent electrode fingers of said pair of adjacent IDTs is substantially equal to $0.25\lambda_{I1} + 0.25\lambda_{I2}$.

Claim 6 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 4~~2~~, wherein in the IDT in which the electrode finger period of said first portion is different from the electrode finger period of said second portion, the center distance between the electrode fingers of said first portion and the electrode fingers of said second portion is substantially equal to $0.25\lambda_{I1} + 0.25\lambda_{I2}$ in a portion in which the electrode fingers of said first portion and the electrode fingers of said second portion are adjacent to each other.

Claim 7 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 4~~2~~, wherein the polarity of the electrode fingers adjacent to each other of the IDT including said first portion and said second portion and the polarity of the electrode fingers of the IDT adjacent to said IDT are different.

Serial No. 09/833,538
October 21, 2003
Reply to the Office Action dated May 22, 2003
Page 4 of 8

Claim 8 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the total number of electrode fingers of said first portion is not more than 18 on both sides of the adjacent parts of a pair of the IDTs which are adjacent to each other.

Claim 9 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the center distance between the electrode fingers, having periods that are not different, of a pair of the IDTs which are adjacent to each other is $(0.08 + 0.5n)\lambda/2$ to $(0.24 + 0.5n)\lambda/2$ ($n = 1, 2, 3, \dots$).

Claim 10 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the center distance between the electrode fingers, having periods that are not different, of a pair of the IDTs which are adjacent to each other is $(0.13 + 0.5n)\lambda/2$ to $(0.23 + 0.5n)\lambda/2$ ($n = 1, 2, 3, \dots$).

Claim 11 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein both of a pair of the IDTs, which are adjacent to each other in the propagation direction of the surface acoustic wave filter, include the first portion and the second portion, and the numbers of electrode fingers of the first portions of both IDTs are different.

Claim 12 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein said piezoelectric substrate is obtained by rotating a LiTaO_3 single crystal in the direction of the Y axis in the range of approximately 36 to approximately 44 degrees with respect to the X axis.

Claim 13 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the film thickness of the electrode

Serial No. 09/833,538
October 21, 2003
Reply to the Office Action dated May 22, 2003
Page 5 of 8

fingers of said first portion is different from the film thickness of the electrode fingers of said second portion.

Claim 14 (original): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 13, wherein the film thickness of the electrode fingers of said first portion is thinner than the film thickness of the electrode fingers of said second portion.

Claim 15 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the electrode fingers of said first portion include a split electrode.

Claim 16 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter comprising longitudinally coupled resonator-type surface acoustic wave filters according to Claim 42 arranged to define at least a two-stage series connection.

Claim 17 (original): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 16, wherein the electrode finger period of said first portion of at least one stage of the multiple-stage longitudinally coupled resonator-type surface acoustic wave filter is different from the electrode finger period of said first portion of another stage thereof.

Claim 18 (original): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 17, wherein the electrode finger period of said first portion is different in each stage of the multiple-stage longitudinally coupled resonator-type surface acoustic wave filter.

Serial No. 09/833,538
October 21, 2003
Reply to the Office Action dated May 22, 2003
Page 6 of 8

Claim 19 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein at least one series resonator and/or parallel resonator is connected to an input side and/or output side of the filter.

Claim 20 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the filter is constructed so as to have a balanced-unbalanced input/output.

Claim 21 (currently amended): A longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42, wherein the filter is constructed so as to have a balanced-balanced input/output.

Claim 22 (currently amended): A communication apparatus comprising a longitudinally coupled resonator-type surface acoustic wave filter according to Claim 42 defining a band-pass filter.
